

CLAIMS

1. A predistortion control device (1), including:
  - a first predistortion control input (10) connectable to a power amplifier output (21);
  - 5 a second predistortion control input (11) connectable to a signal contact (30,31) of a predistortion device (3); and
  - a predistortion control output (12) connectable to a control contact of the predistortion device,
- the predistortion control device (1) further including:
  - 10 a cross-correlator device (110) connected with
    - a first cross-correlator input (1101,1101I,1101Q) to the first predistortion control input (10) and
    - a second cross-correlator input (1102,1102I,1102Q) to the second predistortion control input (11), which cross-correlator device (110) further has
    - 15 a cross-correlator output (1112) (1112) at which a cross-correlation signal can be presented, the cross-correlation signal representing a measured cross-correlation of signals presented at the first cross-correlator input (1101,1101I,1101Q) and the second cross-correlator input (1102,1102I,1102Q);
    - a predistortion function selector device (120), connected with
  - 20 a selector input (1210) to the cross-correlator output (1112), and with a selector output (1211) to the predistortion control output (12), at which selector output a predistortion control signal can be presented, said predistortion control signal representing a predistortion function determined on the basis of said cross-correlator signal.
- 25
2. A predistortion control device (1) as claimed in claim 1, further including a quantiser device (101) connected with a quantiser input to the first predistortion control input, and with a quantiser output to the first cross-correlator input (1101,1101I,1101Q).
- 30
3. A predistortion control device (1) as claimed in claim 2, wherein the quantiser device (101) is a single-bit quantiser.

4. A predistortion control device (1) as claimed in claim 2 or 3, wherein the quantiser (101) is operable as a subsampling device.
5. A predistortion control device (1) as claimed in any one of claims 2-4, wherein the cross-correlator device (110) includes a single-bit multiplier (111).
6. A predistortion control device (1) as claimed in any one of the preceding claims, further including:
  - 10 a distortion device (102) connected with a distortion input to the first predistortion control input, and connected with a distortion output to the quantiser input.
7. A predistortion control device (1) as claimed in claim 6, wherein the distortion device includes a random distortion device.
  - 15
  8. A predistortion control device (1) as claimed in claim 6 or 7, wherein the distortion device includes a periodic distortion device.
9. A predistortion control device (1) as claimed in any one of the preceding
  - 20 claims, wherein the second predistortion control input (11) is connectable to a signal output of a predistortion device.
10. A predistortion control device (1) as claimed in any one of the preceding claims, further including:
  - 25 an averaging device (112) capable of determining a time averaged cross-correlation value from a memory connected to the cross-correlator output (1112), for storing a number of cross-correlation values, which averaging device has an averaging output connected to the selector input, for presenting time averaged cross-correlation values to the predistortion function selector device (120).
- 30
11. An assembly of a predistortion control device (1) as claimed in any one of claims 1-10, and a predistortion device (3) having signal contacts (30,31) including a predistortion input (30) for receiving an original signal to be predistorted and a

predistortion output (31) for providing a predistored output signal based on the original signal, and a control input contact (32) connected to the predistortion control output (12) at which a predistortion control signal can be provided, in response to which predistortion control signal the predistortion

5

12. An assembly as claimed in claim 11, further including a power amplifier (2) connected with an amplifier input (20) to the predistortion output (31), and with an amplifier output (21) to the first predistortion control input (100).

10 13. An electronic device (200), such as a wireless communication device, including a predistortion control device (1) or an assembly as claimed in any one of claims 1-10.

14. A predistortion control method, including:

receiving an output signal;

15 receiving a predistortion signal from a signal contact of a predistortion device; determining a cross-correlation value by cross-correlating the power amplifier output signal and the predistortion signal; comparing the determined cross-correlation value with an model cross-correlation value;

20 determining from said comparing a predistortion function, and providing a predistortion control signal representing said predistortion function.

15. A predistortion control method, as claimed in claim 14, comprising:  
minimising a difference between the determined cross-correlation value with an  
25 model cross-correlation value, and  
deriving from said minimising the predistortion function.